

## Balancing Equations Online

Go to the *Matter & Atoms* page of the Kid Zone at <http://sciencespot.net/> to find the links on this page.

### SITE #1: Chemical Equations

1. What three things does a balanced equation show you?
  1. The REACTANTS which enter into a reaction.
  2. The PRODUCTS which are formed by the reaction.
  3. The amounts of each substance USED and each SUBSTANCE produced.
2. What two things must we remember when balancing equations?
  1. Every chemical compound has a FORMULA which cannot be ALTERED.
  2. A chemical REACTION must account for every ATOM that is used, which is an application of the Law of CONSERVATION of MASS/MATTER
3. What does the  $\rightarrow$  mean? YIELDS
4. What does the  $\leftrightarrow$  mean? SHOWS THAT THE REACTION CAN GO BOTH DIRECTIONS

5. Write a balanced chemical equation that illustrates each type of reaction.

Synthesis -  $2H_2 + O_2 \rightarrow 2H_2O$  OR  $2Mg + O_2 \rightarrow 2MgO$

Decomposition -  $2\text{Li}_2\text{O} \rightarrow 4\text{Li} + \text{O}_2$  OR  $\text{H}_2\text{CO}_3 \rightarrow \text{H}_2\text{O} + \text{CO}_2$

Single-Replacement -  $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$

Double-Replacement (Ionic) -  $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{NaNO}_3 + \text{AgCl}$

**SITE #2: Classic ChemBalancer** - You will need to go back to the Matter & Atoms page of the Kid Zone!

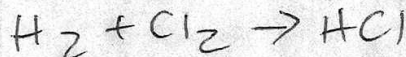
- (1) Click the button for “Directions” and **read carefully**. Click the “OK” button and return to the game screen.
- (2) Click “Start Game” button to give it a try!
- (3) Start by adding a “1” in each box and compare the number of atoms of each element you have on each side.
- (4) Change coefficients to balance each equation and click the “Balanced” button to check it. Correct it if it’s wrong.
- (5) Use the information in the pop-up windows to answer each question and then write the balanced equation before clicking the OK button.

#1



What does "ferrum" mean? IRON  
What color is sulfur? yellow

#2

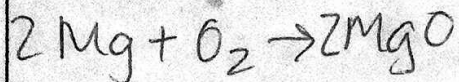


What is HCl? Hydrochloric acid  
Where is it found in your body? Stomach

**More on back ...**

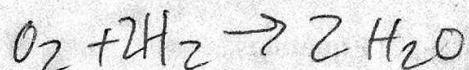


#3



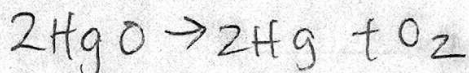
What are pyrotechnics? fireworks

#4



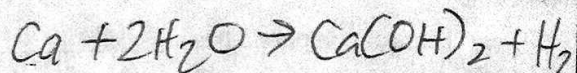
What was the Hindenberg? Luxury blimp  
 What gas was used in it? Hydrogen  
 What gas is used today? Helium

#5



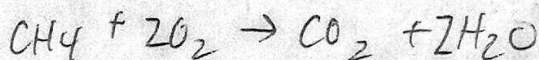
What does the symbol "Hg" represent? Mercury  
 Why should you never touch it? poisonous

#6



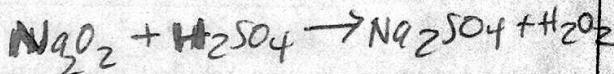
What gas is produced when calcium metal is dropped in water? Hydrogen

#7



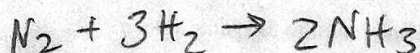
What is  $\text{CH}_4$ ? Methane What gases is it related to? propane & octane

#8



What is  $\text{H}_2\text{O}_2$ ? HYDROGEN PEROXIDE  
 What is it used for? STERILIZATION

#9



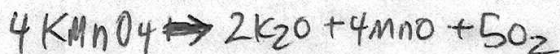
What is ammonia used for today?  
~~FERTILIZER~~ & EXPLOSIVES

#10



How is the oxidation of aluminum different from that of iron? Aluminum's oxidation creates a protective coating

#11



What gas is released when potassium permanganate is decomposed? oxygen

Done? You may visit any of the sites listed on the Matter & Atoms page of the Kid Zone!



## Balancing Equations Online 2

Go to the *Matter & Atoms* page of the Kid Zone at <http://sciencespot.net/> to find the links on this page.

**SITE #1: It's Elemental - Balancing Act** - You will need to go back to the *Matter & Atoms* page of the Kid Zone to find the link!

Start with five equations and the "Beginner" level. Balance the equations that are presented and write the balanced equation in the boxes below. Record your attempts after you have finished each level! You may want to use a piece of scratch paper. If you have time, continue with the Intermediate and Advanced levels.

### Level: Beginner

1-5

1 $3\text{Li} + \text{CeCl}_3 \rightarrow \text{Ce} + 3\text{LiCl}$	2 $4\text{Fe} + 3\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3$	3 $2\text{NO} + \text{O}_2 \rightarrow 2\text{NO}_2$
4 $\text{Mg} + \text{H}_2\text{SO}_4 \rightarrow \text{MgSO}_4 + \text{H}_2$	5 $6\text{NO} + 4\text{NH}_3 \rightarrow 5\text{N}_2 + 6\text{H}_2\text{O}$	<p>Number of Attempts:</p> <p>1 <u>1</u> 2 <u>1</u> 3 <u>1</u> 4 <u>1</u> 5 <u>1</u></p>

### Level: Intermediate

PICK 3

1 $\text{P}_4 + \text{SO}_2 \rightarrow \text{P}_4\text{O}_{10}$	2 $\text{SiF}_4 + 4\text{K} \rightarrow 4\text{KF} + \text{Si}$	3 $\text{C}_4\text{H}_8\text{O}_2 + \text{SO}_2 \rightarrow 4\text{CO}_2 + 4\text{H}_2\text{O}$
4 $4\text{C} + \text{S}_8 \rightarrow 4\text{CS}_2$	5 $2\text{C}_6\text{H}_4\text{Cl}_2 + 7\text{O}_2 \rightarrow 12\text{CO} + 2\text{H}_2\text{O} + 4\text{HCl}$	<p>Number of Attempts:</p> <p>1 <u>1</u> 2 <u>1</u> 3 <u>1</u> 4 <u>1</u> 5 <u>1</u></p>

### Level: Advanced

COMPLETE 1-5 FOR 2 E.C. POINTS

1 $2\text{Li}_2\text{O}_2 + 2\text{H}_2\text{O} + 4\text{LiOH} + \text{O}_2$	2 $\text{Ra} + 2\text{H}_2\text{O} \rightarrow \text{Ra}(\text{OH})_2 + \text{H}_2$	3 $2\text{Ca}_3(\text{PO}_4)_2 + 6\text{SiO}_2 \rightarrow \text{P}_4\text{O}_{10} + 6\text{CaSiO}_3$
4 $4\text{C}_2\text{H}_3\text{OF} + 5\text{O}_2 \rightarrow 8\text{CO} + 6\text{H}_2\text{O} + 2\text{F}_2$	5 $\text{CO}_2 + \text{NaOH} \rightarrow \text{NaHCO}_3$	<p>Number of Attempts:</p> <p>1 <u>1</u> 2 <u>1</u> 3 <u>1</u> 4 <u>1</u> 5 <u>1</u></p>